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Change History

Version	Date	Author	Change Description
PA1	2009-11-06	AWi	First draft
PA2	2009-11-17	AWi	Added Safety Information and Network Configuration

Safety Information

This equipment must be installed in compliance with local and national building codes, regulatory restrictions, and FCC rules.



WARNING: The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet.



WARNING: This unit operates under SELV (Safety Extra Low Voltage) conditions according to IEC 950 / IEC 60950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.

1. Introduction

1.1. About This Document

This document contains technical information and installation instructions necessary for initial setup of the ThereGate TG800. Detailed information for installation and usage of different ThereWare applications is described in the respective application manual.

1.2. ThereGate Software Concept

The ThereGate is provided with basic software out of the box. Additional software and updates are provided over There Corporation Software Distribution Server.

1.3. Functional Description

ThereGate is a technology-independent open Linux-based platform that supports the most common smart home technologies. This makes it an ideal platform for many different applications and needs, as they have a wide range of solutions from different vendors to choose from, and also for third parties to create new solutions and applications.

1.3.1. ThereGate is built on a hardware platform including:

- 1 Gbps Ethernet connectors for 4 LAN and 1 WAN ports

- 11n WLAN

- GSM/GPRS/3G (optional)

- 4 USB 2.0 host connectors for extensions

- Z-Wave

- 6 GB internal storage

- SD card reader with SDHC support for affordable storage extension

- Battery backup for protection of power failures

The hardware platform can easily be expanded to also support other radio- and bus technologies like ZigBee, M-Bus, Modbus among others.

2. Getting Started

2.1. Package Contents

The package contains ThereGate, Power Supply and Table Stand

2.2. Physical Installation

ThereGate is to be placed within range of possible wireless devices. Insert batteries and connect the external power supply. When powered up, check the LED status explained in [LED functionality](#).

2.3. Network Configuration

2.3.1. Connecting to the Web server

Launch your favorite web browser on your computer, and enter the ThereGate's default LAN address in the address field:

http://192.168.1.1/

ThereGate will prompt for user name and password.

The first time you access the web interface, you should use the default user name admin and password admin. The user name and password can be changed from the basic settings later.

After a successful authentication, the Basic Settings page will be displayed.

2.3.2. Basic Settings

The Basic Settings page contains some basic authentication, WAN and LAN settings for the router

(The user name and password are for web access only)

There are four possible setting for the WAN mode:

Disabled

In this mode the WAN connection is disabled, only the local network is accessible.

Ethernet, Obtain an IP Address Automatically

The Ethernet WAN Gigabit port is used for Internet connection and IP address, subnet mask, DNS server address and default gateway address are fetched automatically from the network. In this mode there must be an active DHCP server available.

Ethernet, Static IP Address

Use this setting, if you're required to use a permanent IP address for your Internet connection. The Ethernet WAN Gigabit port is used for Internet connection and IP address, subnet mask, DNS server address and default gateway address are given in separate edit boxes.

3G Cellular Setup

The built in 3G module is used for Internet connection and IP address, subnet mask, DNS server address and default gateway address are fetched automatically from the network using a PPP interface. Before a connection can be established, *Pin Code*, *Telephone Number* and *Access Point Name* should be entered.

This information (PIN Code, Telephone Number and Access Point Name) can be obtained from the mobile telephone operator company, which has provided the SIM card.

2.3.3. Local IP settings

The Local IP Address and Subnet Mask define the local network of the ThereGate router. The local IP address is also used to connect to the ThereGate internal Web server.

2.3.4. Local DHCP server settings

There is a local DHCP server in the ThereGate, which can be enabled from the Basic Settings page. When enabled the following information must be given:

DHCP Starting IP Address is the first address, which can be assigned to any client requesting for an address.

DHCP Ending IP Address is the last address, which can be assigned to any client requesting for an address.

DHCP Lease Time defines the length of an address lease in seconds. The default value is 86400 seconds (24 hours).

Current leases are displayed in the Status page.

2.3.5. Time zone setting

This setting defines the local time zone of the ThereGate device. The internal clock is running in UTC time and this setting is used to add an offset to the system time.

2.4. Wireless Settings

On this page some of the basic wireless radio options can be changed:

To turn the radio off and disable the wireless LAN functionality, select "No" from the *Enable WLAN* setting.

To change the Service Set Identifier (SSID) type an identifier to the SSID field and click 'Apply'. The SSID is the name of the network shared among the members of the wireless network.

To change the radio channel, select the desired value from the drop-down control and click 'Apply'. All devices in your network must use the same channel. The channel is usually detected automatically by the clients.

To disable SSID broadcasting, select "No" from the *Enable SSID Broadcast* setting. When disabled, the ThereGate SSID will not show in client wireless network searches.

2.4.1. Wireless Security

These settings are used to configure your wireless network's security. ThereGate supports three wireless security protocols: WEP, WPA Professional and WPA Enterprise. In addition, the security can be disabled. In this case the network is open for all. Disabling wireless security protocol is not recommended.

Regardless of chosen security protocol it is important that clients are configured with the same settings as ThereGate.

WEP

WEP is a basic security protocol, which is not as secure as WPA.

You must select the network key number to use. The default key is 1.

The network key must be either 5 ASCII characters or 10 hex digits for 64-bit encryption or 10 ASCII characters or 26 hex digits for 128-bit encryption.

WPA Personal and WPA2 Personal

For the WPA modes, you must enter a WPA Shared Key of 8-63 characters in length.

In addition you can select the WPA encryption algorithm, which can be TKIP, AES or TKIP + AES.

3. Connecting Peripherals

Peripheral connection is a multi step process where the details are very much depending on the peripheral and the connection type. The following are examples and detailed instructions for connecting other types of peripherals are provided either with the peripheral or on the web.

3.1. USB Extensions

The USB extension ports are intended for future expansions. Each USB port is capable of supplying 500 mA of power to the connected device.

3.2. Z-Wave Example: Everspring AN148-2 ON/OFF Plug

AN148-2 is an easy to use plug-in binary switch that can be operated manually or remotely.

- Frequency: 868.42 MHz (Europe)
908.42 MHz (U.S.A)
- Operation Range: Up to 100 feet
- LED Status Indication
- Max Load: 3500W
- Power: 220-240 VAC/50Hz
- Operating Temperature: 0°C- 40°C
- Protection degree: Indoor use



3.2.1. Physical Installation

Plug the On/Off module into a wall outlet near the load to be controlled.

Plug the load power lead into the On/Off module. Make sure the load to be controlled cannot exceed 3500 watts.

3.2.2. Search for Z-Wave devices in ThereGate using the Command Line Interface.

Open a telnet session to <IP address of ThereGate> <Port>.

Run the “search” command to start scanning for Z-Wave devices and press the button on the AN148-2 BinarySwitch. If no devices were found, you will need to run the search command again.

The output should look like this:

```
main> search
Found P-devices:
  2 AN158  EverSpring  Not defined
```

3.2.3. Add the Z-Wave device to ThereGate

Devices can be added to ThereGate using command “add”. The index number shall be given as argument:

```
main> add 2
Device(s) added
main>
Advertisment received, I-device 'BinarySwitch_2' added
```

3.2.4. Select device

Once the device is added, it can be selected using the command “select”. Give the name of the device you want to use as a command argument.

Command output lists the services and service methods and method input parameters the device has. The command line prompt will change to show the device name to indicate which device is currently selected.

The output should look like this:

```
main> Select BinarySwitch_2
I-device 'BinarySwitch_2' services and methods:
Service 'BinarySwitchService' service modules:
  SM_GetSwitchState ()
  SM_SetSwitchState (SwitchState:bool)
Service 'BasicDeviceService' service modules:
  SM_GetName ()
  SM_SetName (Name:string)
  SM_GetAvailability ()

BinarySwitch_2>
```

3.2.5. Execute service commands

Using command “exec” service commands can be executed.

Command SM_SetSwitchState (SwitchState:bool) will change the state of the switch, and SM_GetSwitchState will output the state of the switch:

```
BinarySwitch_2> exec SM_SetSwitchState 1
Presentation execute command succeeded.
cmd_status: 0

BinarySwitch_2>
-----
BinarySwitch_2> exec SM_GetSwitchState
Presentation execute command succeeded.
cmd_status: 0
SwitchState: 1

BinarySwitch_2>
```

3.2.6. Remove device

Remove the device using command “remove”. Give device ID as an argument to the command. Device ID is listed by “list pdev”

```
main> list pdev
```

```
P-device ID : 2@com.generic.zwave
```

```
Manufacturer : manufacturer_non_specified
```

```
Model      : model_not_specified
```

```
Tech. Driver : com.generic.zwave
```

```
Serial number: Not defined
```

```
Creation time: 2000-01-28T20:59:07Z
```

```
Location   : Not defined
```

```
State      : Available
```

```
L-devices  : BinarySwitch_2
```

```
main>
```

Press the button on the Switch after the remove command is given.

```
main> remove 2@com.generic.zwave
```

4. LED functionality

There are 12 LED indicators on the side of ThereGate

Alarm	On - Active alarm(s) in system Off - No active alarm
Power	On - Power On Off - Power Off
Internet	On - Internet connection OK Off - Internet connection failure
System	On - System OK Off - System failure or starting
WAN	On - Link OK Flashing - Link activity / data transmit Off - Link down
LAN 1-4	On – LAN port link OK Flashing - Link activity / data transmit Off - Link down
WLAN	On - Link OK Flashing - Data transfer Off - Link down
Battery	On - Running on battery Flashing - Low battery Off - Running on external power supply
SW Upgrade	On - SW Upgrade state activated (loading image) Flashing - Writing image to flash Off - no SW Upgrade active



5. Technical Specification

Physical dimension	230x150x50mm
Operation Environment	Temperature 0 - +40 Celsius Humidity 10 – 80%, non-condensing
Storage Environment	Temperature -20 - +60 Celsius Humidity 10 – 90% non-condensing
Power Supply	8 x AA alkaline batteries (1,5 V) External Power Supply module, output 5 V DC
WAN port	Ethernet 10/100/1000, RJ45 connector
LAN ports (x 4)	Ethernet 10/100/1000, RJ45 connector
USB ports (x 4)	USB 2.0 host ports, type A connectors
Radio Standards	IEEE Std 802.11g 2003, IEEE Std 802.11b 1999, Z-Wave. IEEE Std 802.11n draft w/ software updateability, 2T2R
Radio power	WLAN: Transmit power configurable, max WLAN 11b: 22.88dBm (max) WLAN 11g: 25.20dBm (max) WLAN 11n: 26.29dBm (max) Z-wave: Z-wave standard
Data rates	WLAN: 802.11n (2T2R): 300 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11b: 11, 5.5, 2, 1 Mbps Z-wave: Z-wave specified (40 kbps, 9,6 kbps,)
Radio frequencies	WLAN 2.400-2.483.5 GHz Z-wave: 908.42 MHz
Antenna	WLAN: 2 pieces 2T2R; all internal Z-wave: Internal antenna
Sensitivity	-70dBm (11g @54Mbps)
Channels	11 channels in US/Canada/New Zealand; 13 channels in Europe; 4 channels in France/Singapore; 14 channels in Japan. Area software configurable

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC RF Radiation Exposure Statement

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.